AMENDMENT TO THE CLAIMS

1. (Currently Amended) A method for producing carbon nanofibers, comprising:

causing carbon nanofibers to grow on surfaces of closely packed fine particles, a void ratio of each of the closely packed fine particles being 10% or less;

recovering the closely packed fine particles; and

separating the carbon nanofibers from the surfaces of the closely packed fine particles by a physical process to recover the carbon nanofibers.

2. (Currently Amended) The method according to claim 1, wherein the causing the carbon nanofibers to grow is performed by ~~either one of~~a process selected from the group consisting of a gas flow layer reaction process, a fixed layer reaction process, ~~and~~ a moving layer reaction process and a fluidizing layer reaction process.

3. (Currently Amended) The method according to claim 1, wherein~~,~~ the causing the carbon nanofibers to grow is performed by a fluidizing layer reaction process in which the closely packed fine particles are utilized as a fluidizing material, and~~,~~ the carbon nanofibers are separated by collision among fine particles simultaneously with growth of the carbon nanofibers, to recover the carbon nanofibers.

4. (Currently Amended) The method according to claim 1, wherein~~,~~ the causing the carbon nanofibers to grow is performed by a fluidizing layer reaction process in which the closely packed fine particles are utilized as a fluidizing material in a slow fluidizing state, and ~~wherein~~

wherein the closely packed fine particles are ~~vigorously~~ stirred after reaction termination to separate the carbon nanofibers by collision among the fine particles, to recover the carbon nanofibers.

5 – 7. (Canceled)

8. (Previously Presented) The method according to claim 1, wherein the closely packed fine particles include at least one selected from the group consisting of silica sand, aluminosilicate, zeolite aluminum oxide, zirconium oxide, silicon carbide, silicon nitride, limestone, and dolomite.

9. (Previously Presented) The method according to claim 1, wherein the closely packed fine particles from which the carbon nanofibers have been separated are recycled for reaction.

10. (Previously Presented) The method according to claim 1, wherein a catalyst component is adhered to the closely packed fine particles.

11. (Previously Presented) The method according to claim 10, wherein the catalyst component includes at least one selected from the group consisting of Na, K, Mg, Ca, Sr, Ba, Cr, Mn, Fe, Co, Ni, Mo, W, Ru, Rh, Pd, Ir, Pt, lanthanoid element, oxide thereof, chloride thereof, and nitrate thereof.

12. (Currently Amended) The method according to claim 11, wherein the catalyst component further contains sulfur.

13. (Currently Amended) The method according to claim 10, wherein additive particles for peeling off the carbon nanofibers, which ~~is~~ are different from the catalyst component in particle shape, size and material quality, are used to separate the carbon nanofibers.

14. (Canceled)

15. (Currently Amended) The method according to claim 1, wherein the separating includes

washing the closely packed fine particles with an acidic solution,

adding an organic compound solution to the acidic solution containing the closely packed fine particles to disperse the carbon nanofibers in the organic compound solution, the organic compound solution being a mixture of an additive having a functional group with high affinity ~~with~~ for carbon nanofibers or having a functional group with lipophilic property, and an organic compound which is liquid at room temperature, and

evaporating the organic compound solution to obtain the carbon nanofibers.

16. (Previously Presented) The method according to claim 15, wherein the additive is a compound having a polynuclear aromatic functional group.

17. (Previously Presented) The method according to claim 16, wherein the compound having a polynuclear aromatic functional group includes at least one selected from the group consisting of anthracene, pyrene and chrysene.

18. (Currently Amended) The method according to claim 15, wherein the organic compound that is liquid at room temperature includes at least one selected ~~form~~ from the group consisting of normal hexane, toluene, tetrahydrofuran, dimethylformamide, and chloromethane.

19. (Currently Amended) An apparatus for producing carbon nanofibers comprising:

a reaction apparatus that supplies carbon raw material and closely packed fine particles to cause carbon nanofibers to grow on surfaces of the closely packed fine particles, a void ratio of each of the closely packed fine particles being 10% or less;

a heating apparatus that heats the reaction apparatus;

a recovery line that recovers the closely packed fine particles on which the carbon nanofibers have grown from the reaction apparatus; and

a carbon nanofiber separating apparatus that separates the carbon nanofibers from the recovered closely packed fine particles on which the carbon nanofibers have been grown.

20. (Currently Amended) The apparatus for producing carbon nanofibers according to claim 19, wherein the reaction apparatus is ~~one~~ selected from the group consisting of a gas flow layer reaction apparatus, a fixed layer reaction apparatus, a moving layer reaction apparatus and a fluidizing layer reaction apparatus.

21. (Previously Presented) The apparatus for producing carbon nanofibers according to claim 19, wherein a catalyst supplying apparatus that supplies catalyst to the reaction apparatus is provided.

22. (Previously Presented) The apparatus for producing carbon nanofibers according to claim 21, wherein the catalyst supplying apparatus is a liquid supplying apparatus that supplies catalyst dissolved in carbon raw material into the reaction apparatus in a liquefied state.

23. (Currently Amended) The apparatus for producing carbon nanofibers according to claim ~~22~~21, wherein the catalyst supplying apparatus supplies catalyst into the reaction apparatus in a solid state or a gaseous state.

24. (Previously Presented) The apparatus for producing carbon nanofibers according to claim 21, wherein the catalyst supplying apparatus supplies closely packed fine particles carrying catalyst on surfaces thereof into the reaction apparatus.

25. (Currently Amended) The apparatus for producing carbon nanofibers according to claim 24, wherein the catalyst ~~carrying~~ supplying apparatus carrying catalyst on surfaces of the closely packed fine particles is provided with a fine particle supplying apparatus that supplies closely packed fine particles into a carrying vessel main body, and a spraying unit that sprays catalyst to the closely packed fine particles supplied to the carrying vessel main body.

26. (Currently Amended) The apparatus for producing carbon nanofibers according to claim 25, wherein the carrying vessel main body is ~~of~~ a fluidizing layer ~~type~~ and has a gas supplying apparatus that supplies fluidizing gas.

27. (Previously Presented) The apparatus for producing carbon nanofibers according to claim 25, wherein the carrying vessel main body is a kiln and has a rotary drum.

28. (Previously Presented) The apparatus for producing carbon nanofibers according to claim 19, wherein an average particle diameter of the fine particles is in a range of 0.2 to 20mm.

29 – 31. (Canceled)

32. (Previously Presented) The apparatus for producing carbon nanofibers according to claim 19, wherein the closely packed fine particles include at least one selected from the group consisting of silica sand, aluminosilicate, zeolite aluminum oxide, zirconium oxide, silicon carbide, silicon nitride, limestone, and dolomite.

33. (Currently Amended) The apparatus for producing carbon nanofibers according to claim ~~19~~21, wherein a reaction temperature at a time of contact between the catalyst and the carbon raw material is in a range of 300°C to 1300°C, and a pressure is 0.01MPa or more.

34. (Previously Presented) The apparatus for producing carbon nanofibers according to claim 19, wherein a collision unit that collides against closely packed fine particles is provided in the reaction apparatus.

35. (Previously Presented) The apparatus for producing carbon nanofibers according to claim 34, wherein the collision unit also serves as a heat transfer tube for temperature adjustment inside the reaction layer.

36. (Currently Amended) A method for producing carbon nanofibers, comprising:

causing carbon nanofibers to grow on surfaces of closely packed fine particles, a void ratio of each of the closely packed fine particles being 10% or less, the closely packed fine particles including at least one selected from the group consisting of silica sand, aluminosilicate, zeolite aluminum oxide, zirconium oxide, silicon carbide, silicon nitride, limestone, and dolomite;

recovering the closely packed fine particles; and

separating the carbon nanofibers from the surfaces of the closely packed fine particles by a chemical process to recover the carbon nanofibers.

37. (Currently Amended) The method according to claim 36, wherein the causing the carbon nanofibers to grow is performed by a fluidizing layer reaction process in which the closely packed fine particles are utilized as a fluidizing material in a ~~calm~~ fluidizing state, and ~~wherein~~

wherein the closely packed fine particles are ~~vigorously~~ stirred after reaction termination to separate the carbon nanofibers by collision among the fine particles to recover the carbon nanofibers.

38. (Cancelled)

39. (Previously Presented) The method according to claim 36, wherein the closely packed fine particles from which the carbon nanofibers have been separated are recycled for reaction.

40. (Currently Amended) The method according to claim 36, wherein a catalyst component is adhered to the closely packed fine particles.

41. (Currently Amended) The method according to claim 40, wherein the catalyst component includes at least one selected from the group consisting of Na, K, Mg, Ca, Sr, Ba, Cr, Mn, Fe, Co, Ni, Mo, W, Ru, Rh, Pd, Ir, Pt, lanthanoid element, oxide thereof, chloride thereof, and nitrate thereof.

42. (Currently Amended) The method according to claim 41, wherein the catalyst component further contains sulfur.

43. (Currently Amended) The method according to claim 40, wherein additive particles for peeling off the carbon nanofibers, which are different from the catalyst component in ~~particles~~ particle shape size and material quality, are used to separate the carbon nanofibers.

44. (Currently Amended) The method according to claim 36, wherein the separating includes

washing the closely packed fine particles with an acidic solution,

adding an organic compound solution to the acidic solution containing the closely packed fine particles to disperse the carbon nanofibers in the organic compound solution, the organic compound solution being a mixture of an additive having a functional group with high affinity ~~with~~ for carbon nanofibers or having a functional group with lipophilic property, and an organic compound which is liquid at room temperature, and

evaporating the organic compound solution to obtain the carbon nanofibers.

45. (Currently Amended) The method according to claim 44, ~~wherin~~ wherein the additive is a compound having a polynuclear aromatic functional group.

46. (Previously Presented) The method according to claim 45, wherein the compound having a polynuclear aromatic functional group includes at least one selected from the group consisting of anthracene, pyrene and chrysene.

47. (Previously Presented) The method according to claim 44, wherein the organic compound that is liquid at room temperature includes at least one selected from the group consisting of normal hexane, toluene, tetrahydrofuran, dimethylformamide, and chloromethane.